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ABSTRACT

A report is presented on an analysis of sex factors in academic income variation as determined by achieved, ascribed, and university location characteristics. The study group consisted of 5450 individuals at a major midwestern university as of June 1971. The subjects included 4541 men and 908 women research assistants and associates, deans and vice presidents, editors, project directors, consultants, curators, and faculty. Findings demonstrate that achievements are the dominant income-determining variable for both sexes, but women's payment rates are lower and less subject to the variation of race, citizenship, and internal location; and that the ascribed and location characteristics also have sex-separate effects. It is concluded that while an achievement value governs reward, a universal sex standard does not. The achievement ideology operates, but it is practiced under sex separate standards and therefore academic income forms a dual reward structure. It is explained that sex work separation, and the normative structure of science, are among the mechanisms permitting and promoting the dual income structure. Extensive tables are included. (Author/PHR)

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SEX, INCOME, AND ACHIEVEMENT: REWARD-DUALISM IN ACADEMIA

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Abstract

This paper reports an analysis of academic income variation, as it is determined by achieved, ascribed, and university location characteristics--and as it varies by sex. Regarding achievements as the "legitimate" income determinants, the study not only analyzes the extent, but also specifies the form and locus, of academic sex-wage variation; hence, it provides an analysis of the internal complexity of the sex-wage variation--as it is institutionally determined.

We find that:

1. Achievements are the dominant income determining variables for both sexes. But, women's (achievement) payment rates are lower; structurally, less subject to the variation of race, citizenship, and internal location; and different, too, in the greater income importance of higher credentials.

2. Although less important as income determinants, the ascribed and location characteristics also have sex-separate (rate and structure) effects.

We conclude that:

1. An achievement value governs reward, but a universalistic sex standard does not. The achievement ideology operates, but is practiced under sex separate standards; and, hence, academic income forms a dual reward structure.

2. Sex work separation, and the normative structure of science, are among the mechanisms permitting and promoting this dual income structure.

SEX, INCOME, AND ACHIEVEMENT: REWARD-DUALISM IN ACADEMIA

INTRODUCTION

The male/female disparity in wealth, power, and prestige is a universal social phenomenon. Throughout time, and across place, men have had greater material rewards, a higher level of deference and esteem, and a more dominant position, in control of persons and activities, both of themselves and others (Friedl, 1975; Schlegel, 1975; Tavris and Offir, 1976).

In American society, sex stratification is most apparent in the labor force, and the most marked aspect of that stratification is income inequality. Across occupations, full time female workers earn 60% of that earned by males (U.S. Department of Labor, 1974). And, within literally every (census) occupational classification, women may be found to be earning less than men (U.S. Dept. of Commerce, Bureau of Census, 1967).

Here, we focus upon sex-income variation in a particular and central organizational setting, occupational context, and theoretical perspective: We investigate the sex-income differentials among academic employees of a major university; and assess those differentials in terms of an achievement-reward value.

A substantial literature establishes the prominence of achievement, along with disinterestedness and rationality, as the manifest values that orient, guide, and control the behavior of scientists and academicians (Merton, 1949; Caplow and McGee, 1958; Cole and Cole, 1973). Yet, in spite of the salience of the academic, achievement value and universalistic standard, a number of studies report a significant

gap in the earnings of academic men and women, and implicitly point to sex as an income determining factor.

Of these studies, however, the earlier ones have largely focused upon a simple, documentation of the sex-earnings gap, without factoring characteristics which might help explain the disparity (Bayer and Astin, 1968; Eidsen, 1970; Converse and Converse, 1971; LaSorte, 1971). Further, conclusions of these, as well as the later, studies are restricted by samples limited to the natural and social science disciplines (Fidell, 1970; LaSorte, 1971); confined to employees with a doctorate (Simon, Clark, and Galway, 1967; National Academy of Sciences, 1968; Ferber and Kordick, 1978); and restricted to persons receiving a Ph.D. during a limited time period (Simon, Clark and Galway, 1967; Bayer and Astin, 1968; Astin, 1969).

More recent, microeconomic--single-institution--studies of faculty salaries have employed sophisticated, multivariate techniques in the analysis of a larger number of salary predictors, including sex (Gordon, Morton, and Braden, 1973; Katz, 1973; Reagan and Maynard, 1974). But, these, as well as the recent, and more intricate, multi-institutional analyses (Bayer and Astin, 1975), have failed to specify the complexity--particularly, the internal, location complexity--of the academic sex-wage structure.

In contrast, our income study analyses both achieved and ascribed characteristics of the employees, and structural and contextual characteristics of the employees' university unit location. These location characteristics are leading indicators of the academics' work type, work place, and fellow work group. In turn, these location features are sex-separated characteristics, which parallel the labor

divisions of men and women, in the society, at large. In this way, our study recognizes and analyses, for academics, what has been recognized for male and female employees elsewhere: Income differentials may be attributed to properties of employment-location, as well as employee-characteristic (Rees and Schultz, 1970; Fuchs, 1971; Shepard and Levin, 1973).

Further, these analyses encompass academic employees across all units and departments of a major university, including two significant groups overlooked in previous studies--faculty in the professional schools, and researchers with academic appointments.

Finally, in theoretical perspective, this study presents an analysis of sex as an actually operative, but ideologically illegitimate, science-reward criterion. This offers a central organizational test of the achievement-reward process; and, in conclusion, certain structural suggestions of how and why this sex-inequity "works" with relatively little discord or conflict.

METHOD

Data

This study represents a cross-sectional income analysis for the academic employees at a major, midwestern University. The data source is the personnel tape of the University, at one point in time, June, 1971.

The academic employees constitute a group of 5450: 4541 (83.3%) males and 908 (16.7%) females. The academic classification comprises faculty, as well as researchers and administrators not directly related to the business affairs of the University. This includes research assistants and associates, deans and vice presidents, as well as

editors, project directors, consultants, and curators. It excludes all clerical, trade, operative, and service workers. It also excludes student employees--an academic group atypical in their appointment type, employment continuity, participation mode, and reward structure.

Dependent Variable: Salary

Academic salary is a monthly rate[1] referring to the amount an employee earns for full-time employment, whether or not s(he) is actually working full-time. This salary rate implicitly standardizes for proportion time employed, and functions for academics, with the advantage of "hourly earnings"--a rate that controls for differences in annual hours worked among industrial workers.[2]

Independent Variables

Achieved Characteristics

We analyze the variable, age, in quadratic form[3], to approximate the attainment of professional experience, including experience that may predate the employment at present University. For academics, though not necessarily for other employees, age seems as legitimate a measure of professional experience for women as for men. Because of child bearing and caring, female employment patterns, in general, have been characterized by discontinuity (Mulvey, 1963). But discontinuous career patterns have not been characteristic of highly educated women, such as doctorates (Astin, 1969), and scientists (Zuckerman, 1970).[4]

Moreover, our group of academics, unlike those of Astin's doctorate and Zuckerman's scientist samples, are all located in a major, research university. This institutional homogeneity of our study population further ensures high career commitment and continuity for both men and women.

Educational attainment, regarded as both a direct indication of performance skills (Hause, 1971), and an indirect representation of trained performance capacity (Siegel, 1971), is coded as highest degree earned. There are three levels: doctorate, medical or law degree; master's or bachelor's degree; and no degree.

Academic title, or position, signifies rank, manifest in privilege and reward.[5] The title classification includes faculty and academic nonfaculty, both those without, and those with faculty senate affiliation, which indicates a higher rank, and type of tenured status for nonteaching academics.

Years at the University reflects attainment of current, institutional experience, while the age variable approximates longer-term, professional experience, over the life cycle.[6] Since not all employees enter the University during their 20s, these two variables, together, allow us to separate the (income) effects of, say, five years at the university at age 30, versus age 50.[7]

Ascribed Characteristics

We include race (majority vs. minority), as an ascribed, and hence illegitimate income determining variable.

Citizenship, indicating nativity and national origin, is a more focal ascribed characteristic in the university than it is in other institutions employing professionals.

Sex is the pivotal variable, constituting the strata which divide the analyses.

Location Characteristics

The achieved and ascribed variables refer to characteristics of employees--their qualifications, as well as their personal backgrounds.

The location variables, on the other hand, are properties of the academics' context of employment: the nature of the work (unit type); the structure of the work unit (unit size); and the characteristics of the group doing the work (percentage unit female).

Unit refers to the departments of the literary college, the other (17) colleges and schools, and the remaining (7) non-college units with academic employees. The units are coded to reflect functional classification within the University: different tasks, functions, and roles. This functional labor-division is, in turn, sex-separated in the university as in the society, at large.

Hence, among our non-teaching locations, the administrative units, which manage, tend, and direct general university operations are male-typed places; and the service units, engaging in areas of student services, state and public relations, and community services are female-typed places. Similarly, among teaching locations, the traditional, high status professional schools, linked to powerful functional areas, such as law, business, and technology, represent male domains; and the less established, lower status professional schools, linked to more marginal institutions, such as education, public health and welfare, represent female areas. In this way, unit location is related to gender, and hence to 1) our ascribed versus achieved income determining distinction, and 2) our focus upon variation and patterns in sex and salary.

Data Restrictions

This study is restricted by limitations of: 1) the data time-point; 2) the single-institution population; and 3) certain unavailable variables, including productivity measures.

The data-source, a personnel tape, contains income data for one time-point--June 1971. More, recent multivariate data are unavailable, for study comparison or replication. However, recently available gross data suggest a remarkable stability, rather than change, in sex-wage disparity. This data shows the female/male salary ratio for teaching faculty to be as sex-discrepant in 1978 as in 1971.[8] This persistence of faculty, sex-wage disparity is consistent with other studies reporting that, in economic status, academic women have been faring only slightly, if at all, better over the past decade (Bayer and Astin, 1975; Centra, 1974; Ferber and Kordick, 1978).

The single-institution data limits generalizability to other smaller, and more minor, academic settings. However, this restriction is advantageous, in other ways. First, the single-institution study allows for intensive analysis of wage structure as it is, in fact, determined--at the institutional level (Katz, 1973; Malkiel and Malkiel, 1973).

Second, the absence, and unavailability, of a productivity measure may be ameliorated by the single-institution data: Holding institution constant, and controlling for rank, in this study, eliminates certain sex-differences in professional environment and circumstance--which, in turn, eliminates some of the (sex-differential) conditions found to account for the higher male publication rate among academics and scholars, at large (Bernard, 1964; Astin, 1969; Tsuchigane and Dodge, 1974).[9]

We certainly do not suggest homogeneous intra-University productivity. Nor, do we imply that our test of sex, achievement, and reward is unrestricted by the absence of a valid productivity measure.

Rather, we say that in the analysis of sex-differential reward, the measure's absence is ameliorated by the single-institution data, which reduce the effect of sex-differential productivity.

Analysis Technique

The analytical method combines both econometric modeling, and comparative statistics.

Salary relationships are expressed in multistage regression models. The first-stage earning models express the gross relationships between salary and each set of achieved, ascribed, and location characteristics; the second express the net relationship between salary and the achieved and ascribed characteristics; the third the simultaneous, net relationship between salary and every characteristic.

This multi-stage sequence of gross and net salary effects enables us to compare the coefficient values of the equations, and hence specify, and decompose, the determination of academic income. This then allows us to analyze academic income reward 1) as it operates for men versus women, and 2) as it is influenced by achieved and performance criterion:

1. Sex differences in income reward are made apparent through different coefficient values, and thus different income exchange values, for employee characteristics. These analyses are then in the methodological tradition estimating group-differential, human-capital income returns, as the cost or benefit of minority or majority group characteristics (Duncan, 1968; Siegel, 1965; Suter and Miller, 1971).

Furthermore, we compare male-female differences in the income exchange values of employee characteristics with a test[10], enabling the null hypothesis test ($C_1-C_2=0$) that there is no difference in the rate

at which men and women exchange employee characteristics.

The male-female difference in contrasting characteristic effects of adjacent academic titles (Associate vs. Assistant Professor), educational levels (Ph.d. vs. B.A/M.A.), or different University unit locations is also assessed. The statistical significance of the contrast is determined through a simple difference of means test, and a comparison of these contrasts may be made for men and women. This allows inference about the sex-differential consequences of higher compared to lower rank and degree, or different University locations.[11]

2. The coefficient values of the regression equations also allow us to assess the relative importance of achievements, as income determining variables.

This is accomplished by comparing the coefficient-achievement values, and explained income variation, between multi-stage models. These multi-level comparisons enable us to elucidate sex-achievement patterns, by assessing the limit and extent to which achievements are significant income determinants. This then allows us to evaluate the "achievement-legitimacy" of the income determining process.[12]

We also assess the significance of achievements, by comparing explained income variation (R^2) in a model that includes variables $X_1 \ldots X_k$, with a model that includes $X_1 \ldots X_{k+m}$, where a set of m variables are added.

If, for example, income variation explained by achieved characteristics is significantly increased with the addition of ascribed characteristics, then race and citizenship may be said to be important in explaining income variation, independent of the effects of other variables. This would suggest that income returns on achievement are

influenced by the personal characteristics of the performers.

FINDINGS AND DISCUSSION

Achievements emerge as the dominant determinants of academic income.

First, these are the characteristics that explain the variation in academic income. Achievements, alone, explain 64.5% and 61% of the variation in male and in female salaries, respectively. Ascribed characteristics increase the explained variation by very little for males (.3%) and females (.2%). Location explains an additional 4.7% and 2.8%, raising the total explained variation to 69.5% for men, and 64% for women.

Further, the importance of the ascribed and location characteristics lies not in their consequence for reward alone, but principally in their consequence for the structure of achievement-reward. Moreover, ascribed and location characteristics do not necessarily alter the reward structure by diminishing the achievement effects. In some cases, they amplify the effects of achievement, by increasing net payment, as is the case with the impact of location for title payment.

Finally, rewards for achievement are not independent of location, race, and citizenship. Yet, the converse net effect, achieved upon the ascribed and location payments, is even greater, indicating the income determining strength of achievements.

While achievements are the income dominator, sex is the great divider of reward. The male and female returns for achieved, ascribed, and location characteristics are not only different in payment rate, but different also in payment structure. For each set of characteristics,

women's income payments are lower; less dependent upon each other set; and hence, different in their income determining effects.

This sex-payment pattern is especially true for achievements. Achievements pay women at a lower rate, and are somewhat weaker predictors of income. Payments for age/experience, academic title, and educational attainment[13] are all significantly lower for women.

Academic title payments are higher for men than for women. The Instructor rank is worth 39% more for men; the Assistant Professor, 46%; the Associate, 12%; the Professor, 18% more. Among educational attainments, the bachelors/masters degree is worth 33% more for men and the doctorate/professional degree is worth 18% more. Similarly, men's age/experience payments are higher for each five-year interval (Table 1).

insert Table 1 about here

Furthermore, women's achievement-reward differs not only in payment rate, but also in payment structure. Structurally, female, compared to male, achievements are important, especially, in the contrast between the effects of higher versus lower credentials. Women receive lower payment than men for all educational and title levels. However, the income difference between the bachelor's/master's versus doctorate/professional degrees is 30% greater for women than for men; and the income difference between the assistant and associate titles is 230% greater for women (Table 2).

insert Table 2 about here

These contrasts suggest the greater income importance of higher educational and title attainments for academic women. Women cannot expect to receive as great a payment as men for highest levels of

attainment, but they suffer even greater disadvantage when their credentials are less than the best.

And as we shall see, women's achievement payments are also, structurally, less subject to the variation of both race, citizenship, and location.

Ascribed characteristics, race and citizenship, have a small effect upon the achievement payments of men, but a nearly negligible effect for women (Table 3).

insert Table 3 about here

Ascribed characteristics somewhat decrease men's achievement payments. The reduction indicates that between 2-18% of the male achievement reward, depending upon the particular characteristic, is due to the majority racial and citizenship statuses of men with those achievements, rather than the credentials and qualifications, per se.

For women, the effect of ascribed characteristics upon achievement payments is not merely small, but nearly negligible. Ascribed characteristics do not alter achievement payments, excepting that for education payment. And, this change is an increase, rather than decrease, suggesting that education may be worth something less to majority, compared to minority, status women.

Furthermore, these models show a converse net effect, achieved upon ascribed characteristics. This effect is greater than its inverse, more striking for race than for citizenship, and more marked for men than women (Table 4).

insert Table 4 about here

Majority race and citizenship are much greater, gross advantages for men than women. Yet, achievements reduce the gross male reward for

white race by 75%, to an insignificant ($34) payment. Hence, achievements being equal, white race is not a significant male advantage. But, native citizenship is. Achievements reduce, but do not obliterate, the significant male payment for native citizenship.

For women, also, native citizenship continues to be rewarding, but not at a statistically significant level. Majority race, on the other hand, ceases altogether to be a female advantage. Change in the direction of the race effect indicates that there is clearly no female payment for white race, and there may be a slight edge for minority race.

As income determinants, location characteristics are more important than ascribed, but much less important than achieved, characteristics. And, as with the other characteristics, the effects differ by sex. For men, every location variable (unit type, size, and percentage female) is a significant net income determinant. For women, on the other hand, only about half of these location characteristics are significant, and as a variable set, the characteristics explain only half as much income variation for women as they do for men (Table 1).

The greater importance of the net location effects is in their consequence for the structure, rather than the predictive strength, of income reward. Location characteristics alter the reward structure for all achievements, for both sexes. But, the changes are greater for men, indicating that while rewards for achievement are not independent of University location for either sex, the achievement-location relationship is stronger for males (Table 5).

insert Table 5 about here

Location reduces payment at lower (25-40 year) age/experience

intervals, and raises the payment at older (45-60 year) intervals, for both sexes. This suggests a tendency for younger academics to be in higher paying locations, and for older academics to be in somewhat lower paying places (Figure 1).

insert Figure 1 about here

Location also influences seniority payments, and suggests the location of high seniority males, but not females, in high paying units.

The strongest location-achievement effect, however, is for academic titles. Location raises the income effect of every title, indicating that payment for title varies with employee characteristics, and hence, that controlling for location increases the effect of title, per se (Table 5).

Location makes a considerable difference in the title-payment for all academics, but while the effects are sweeping, they are not even. Location effects are greater for teaching academics, especially those of low rank, and for men. Location is not as critical in determining title-payment for nonteaching academics, for high ranking faculty, or for women.

Correspondingly, location increases, and hence affirms and accentuates, the sex disparity in payment contrasts between adjacent academic ranks, and suggests the following sex-income "promotion pattern": Advancement to the tenure track (assistant to associate) is worth half the increment for women that it is for men; once on track, promotion to a tenured position is worth twice as much for women, compared to men; once in tenured position, advancement to the highest, Professor, rank again makes a greater income difference for men (Figure 2, Table 6).

insert Figure 2 and Table 6 about here

Location, similarly, accentuates the sex disparity in patterns of educational payment. This indicates that the pattern of lower educational payment, as well as the more critical income difference of the higher degree for women, does not simply reflect the sex disparity in units of certain type, size, and composition (Table 5).

Likewise, location changes the income effects, but not the income pattern for ascribed characteristics (Table 7). Location barely influences the race and citizenship payments for women, indicating that these female payments are relatively independent of variation in location, as well as achievement.

insert Table 7 about here

Location reduces men's payments for race far more than it does for citizenship, indicating that part of the reward for white race reflects the high paying location characteristics of white men. But, unlike race, citizenship remains an advantage, in itself, independent of the location, as well as the achieved, characteristics.

Finally, the multi-stage models allow us to compare the gross and net effects of the location characteristics, themselves. This enables us to estimate the extent to which payments for location may be attributed to levels of achievement, and hence, to assess the relative independence of University location, and the relative importance of achievement, in the determination of academic income (Tables 3, 8).

insert Table 8 about here

These gross-to-net models show that some location effects are a reflection of the achievement levels within them; that others are not; and that these effects vary for men and for women.

Thus, among location types, the income effects of 1) nonteaching (administrative, service, and research) units increase, 2) the literary college (arts, sciences, and social science) units decrease, and 3) the professional school units remain relatively stable. And across types, the effects are more marked for men than women.

These changes indicate that the gross disadvantage of nonteaching units, versus the advantage of teaching units, reflects the income effects of lower, compared to higher, achievements between these units, rather than the effects of location, per se. The stability in the returns for professional schools[14], on the other hand, suggests a relatively pure and independent location effect (Tables 8, 9).

insert Table 9 about here

The traditional, high status schools, linked to powerful and male-dominated institutions, such as law, business, and technology, are advantageous locations for men, but not for women. The other, lower status schools, linked to more marginal, and female-dominated, institutions, such as education, public health, and welfare, are advantageous for women, but not for men. Moreover, these income effects of professional school location, the costs as well as the benefits, are more marked for men than for women (Tables 1, 8).

To illustrate, the male ($90) payment for location in their same-sex (traditional professional) schools is much greater than the ($3.63) female cost for location in these male-sex units. Similarly, the ($119) male cost for location in their opposite-sex-typed (nontraditional professional) schools is significantly more than the ($78) female payment for location in these female-sex units (Table 1).

The pattern is bolstered further by the observed sex contrast in

the effects of the sciences versus the arts (Table 2):

Neither the sciences nor the arts are advantageous net locations, for men or for women. But, the contrast between the effects shows a relative $100 science advantage for the men, and a $16 arts advantage for the women. This indicates a large male benefit, but a paltry female benefit for location in same-sex departments.

Hence, women gain and men lose from location in female-typed units; men profit and women lose slightly from location in male-typed locations. In general, both the benefits of same-sex unit location, and the costs of opposite-sex unit location are greater for men than for women.

The other location effects--unit size and sex composition--are far more independent of the effects of achievement for women than they are for men. Women's payments for location size and sex composition remain the same, gross and net of achievement (Table 8).

But, the payments change for men. Percentage unit female changes from a cost to a small payment, suggesting somewhat higher achievements of men in units with smaller percentages of women. Unit size also changes from gross cost to net payment, suggesting that the gross advantage of smaller units reflects higher achievements of men in these locations (Table 8).

CONCLUSIONS

As the data converge, in the final income models, they point to a common conclusion: Achievement variables are the dominant income determinants, and sex is the divider of reward. The male and female returns for achieved, ascribed, and location characteristics are different not only in payment rate, but also in payment structure. For

each set of characteristics, women's income payments are lower; less dependent upon each other set; and hence different in the structure of their income determining effects.

This is especially true for achievements--experience, rank, and education. Women cannot expect to receive as great a payment as men for highest levels of educational and rank attainments, but neither can they afford to forego the attainment: When women's credentials are less than the best, they suffer even greater income disadvantage.

The ascribed and location characteristics also have sex-separate effects. Majority race and citizenship are greater advantages for men. And while location effects, both costs and benefits, are more marked for men, the same-sex typed units are found advantageous, and the opposite sex typed units disadvantageous, for both sexes.

But, compared to achievements, the ascribed and location characteristics are less important income determinants. They explain a far smaller proportion of the variation in academic income. Further, these characteristics are significant not in their consequence for reward, alone, but principally in their consequence for the structure of achievement-reward.

Our test of sex, achievement, and reward is restricted by the variables available, and would certainly be sharpened by additional measures of performance and productivity. Nonetheless, among our variables, the achievement (i.e. "legitimate") factors are determining reward. Yet, women's payments are lower, reduced by gender, an "illegitimate," ascribed factor. Hence, we conclude that academic income forms a dual reward structure--which is both the same, yet different, for men compared to women. In closing, we discuss the

implications of this dual reward structure for the functioning of the performance ideology; and we suggest certain mechanisms by which both inequity and ideology "work" within this institution.

Achievement is not merely a criterion of reward in academia; it is a value primacy for the very activity and goals of the institution. Here, the achievement ideology explains and justifies rank and reward, and supports and maintains inequality, as ideology does everywhere. Moreover, as part of the scientific work ethos, achievement and performance standards justify the presence, the purpose, and the persistence of the academic activity, itself. The functioning of reward in academia is thus a test of the operation of the achievement ideology in a prime value context.

The achievement value does operate in this University. But it is practiced under sex-separate standards. An achievement value is governing reward, but a universalistic sex standard is not. Such malfunctioning can have consequences for the solidarity of membership, and the support of values.

But, the discrepancy between the achievement value and the reward practice is not entirely obvious in this University. The achievement-reward similarity functions along side of payment-rate dissimilarity. This creates a no less discrepant, but not necessarily apparent, sex reward structure: Academic employees, men, as well as women, must prove themselves achievement-worthy. But, to allege that achievement values make sex-income equality in the University is akin to claiming that American opportunity beliefs create race-employment equality in the larger society--because "a white is not guaranteed a good job by birth, but must compete for the position, just like a black."

If "like black" could be conceptually substituted for "white" in that statement, race reward structures would be operationally equivalent. But they are not. And neither are the University sex reward structures. Achievement and opportunity may be strong, even dominant, values. But they get translated into different, rather than equivalent, sex reward standards.

In this way, the structure of the reward disparity--discrepant but not necessarily apparent--may itself, reduce the recognition, and hence strain, of the gap between achievement ideology and practice. A second structural factor, reducing the apparency and strain of the academic reward disparity, is sex work segregation.

Like other tasks, in most places, work in the University is sex-segregated. Academic men tend to hold high level administrative, research, and faculty positions, and to be located in sex-linked business, technical, and medical professional schools, and the science and social science departments. Women, on the other hand, hold lower level research and faculty positions, and are predominately located in the services, or in the public health, welfare, and education professional school units.

Furthermore, this structural separation is rewarding, and hence, reinforcing. Salary levels, male and female, are enhanced by the same-sex locations, and depressed by opposite-sex locations. In addition, the between-sex salary disparity is more tenable when it is less apparent, and separation makes the sexes, as well as their discrepant rewards, less visible to each other. Thus, segregation may reduce the recognition and stressful response to reward dualism.

Two other factors may be operating to reduce the strain, and make

discrepant reward more tenable: the rules of science; and the roles of women, in the profession, and the society, at large.

Compared to other occupational groups, scientists tend to regard the rules of their work--the criteria, the evaluations, and the rewards--as highly legitimate (Zuckerman, 1971; Cole and Cole, 1973). Scientists tend to attribute both success and failure to individual performance, rather than institutional structure. Consequently, frustrated aspiration and failed attainment produce a remarkably low rate of alienation and deviant behavior (Cole and Cole, 1973). The source of this occupational integration seems to be in the scientific norms, particularly the norm of "disinterestedness."

Normative interest in the service of the scientific community, rather than self, disposes both men and women to regard the evaluations, as well as the rewards, of their work as essentially equitable and legitimate. But, for academic women, the reward, as well as its evaluation, is further tempered by a particular gender and professional role.

Gender doesn't just limit the reward for the academic position; it restricts the professional role, itself. A professor is assumed to be male; the gender and position are equivalent. A woman who is a professor is a "female professor"; the gender and professional position are not equivalent. The female gender role has been regarded as intrinsically familial, and the profession an added, rather than inherent, dimension. Even recent studies report wife, and motherhood, as the central statuses of American women, including professionals (Poloma and Garland, 1971).

Gender role definitions are changing, but the role differences long

persist. They may be reflected in sex-differential meanings and evaluations of reward. These evaluations can qualitatively reduce sex wage discrepancy, and achievement reward disparity. In this way, the cultural emphasis upon the primacy of the domestic, and familial female role diminishes the strain of inequity in other (secondary) contexts.[15]

Finally, our conclusions about academic reward must be subject to the following cautionary about the achievement meaning, and gender significance, of our reward criteria:

Achievement is no simple product of motivation and ability (Zuckerman, 1971). Rather, attainments are the result, also, of restricted and sex-related access. Institutional barriers and cultural obstacles place women in structural positions, which make it more difficult for them to accumulate credentials, and produce evidence of performance. These barriers restrict access to training, sponsorship, and support so that academic credentials are limited opportunities.

This restricted access renders sex-bias unto any achievement measure. This is not only the case for our measures of rank and degree, but also for other "legitimate" academic achievements--from graduate admission, fellowship, and commencement, to professional awards, offices, and grants. Our estimated payments for achievements are, then, sex-related measures. As a consequence, the male-female disparity in the achievement-reward structure is actually an underestimation of the effect of sex, and the reward dualism is probably an understatement of the sex-separate standards.

FOOTNOTES

[1]The log of salary did not improve the fit with the independent variables, and was hence rejected as the salary form.

By university personnel standards, the full-time monthly rate is calculated in the following way: For a one-term appointment, the time proportion is adjusted to reflect full- employment, and the salary is divided by 4.5; for a two term (academic year) appointment, adjusted proportion is divided by 9; for teaching appointments of two and a half terms, adjusted proportion is divided by 12.

A larger proportion of women hold nonteaching academic (i.e. research) appointments, and thus have their monthly salary rate calculated with the larger divisor. But, possible downward bias in the salary rates of women is meliorated by the inclusion of title (type of position) variable.

[2]We analyzed the effect of percentage time working in the determination of the (full-time equivalent) salary rate. Other characteristics being equal, the time variable was of low rate-determining significance for men, and of no significance for women. Hence, remuneration for part-time work, in this university, is roughly proportional to reward for full-time employment.

[3]The variable takes this form, because the age-salary relationship is linear only until age 55 for men, and until about 35 for women. Analysis in quadratic form permits us to assess the effect of age, depending upon a given age interval; to estimate the salary effect of change in age between intervals 25-30 or 30-35; and to compare the effects for men and women.

[4]Some sex differences, in career continuity of the highly educated,

have been reported, but the differences are small.

Examining two cohorts of women receiving doctorates between 1958-1963 and 1967-1971, Ferber and Kordick (1978) report that 93.7% of the first, and 95.2% of the second, cohorts are presently employed. Further, of those presently working, cohort I had been employed 91.4% of the time, and cohort II, 92.7% of the time. The comparable data for male cohorts are 98% and 99%.

[5]As an indication or measure of professional accomplishment, title is related to, but not absolutely correlated with, salary. Correlations between salary and title (administrator, professor, associate prof., assistant prof., instructor, lecturer, other-faculty senate) are .16, .62, .10, -.07, -.07, .10 and .07 for men; and .08, .50, .34, .12, .001, -.05, and .11 for women. Hence, title does not simply represent another measure of salary, itself.

[6]The age and years of experience variables are correlated, but not perfectly linear (r=.73 for men, .63 for women).

[7]Hence, while the data set does not provide an (organizational) "entry-age" variable, our combination of both age and years of experience gives us an "entry-age" effect.

[8]Our 1971 data show that among teaching academics, the ratio of female to male salary ranges between a high of .89 for associate professors to a low of .78 for instructors, with lecturers (.88), assistant professors (.83), and full professors (.82) falling between that range.

Calculations from the University's gross-level salary statistics for 1978 show the same pattern and level of sex-wage disparity, with female to male salary ratios ranging from a high of .87 for Associates, to a low of .71 for instructors, with lecturers (.82), assistant

professors (.80), and full professors (.83), in between.

[9]While institutional affiliation accounts for a large proportion of the sex differential productivity among scholars, in general, it is not as important a factor for (natural, biological, and physical) scientists, in particular (Zuckerman and Cole, 1975).

[10]The test statistic is $(C_1-C_2)/\sqrt{s_1^2+s_2^2}$, where C_1 is the coefficient value of a given characteristic for men, C_2 is the value of the same characteristic for women, and s_1 and s_2 are the respective standard errors of the coefficients.

[11]These particular analyses are restricted by the cross-sectional nature of the data. A firm test of the income consequences of promotion or professional experience would require longitudinal data of academics' employment history. Lacking these data, we measure , instead, the salary effect of title-change or age-change for groups of employees, rather than the same employees. The group effect does, of course, limit inference.

First, observed group change is not a "pure age/experience" effect. Professional training and preparation, the professional marketplace, and supply-and-demand factors vary over time. These factors create cohort effects (training, skills, supply-and-demand) that may be reflected in the group data. The time frame of the data, June 1971, may also result in the bias of certain cohort effects.

Nevertheless, the "change effects" are in the group data, but they are tempered by time and cohort factors, and are not "pure" variables.

[12]If the inclusion of an ideologically illegitimate (i.e. ascribed) characteristic in a legitimate (i.e. achievement) model significantly lowers the rate at which a legitimate variable (e.g., education, or title) is exchanged for salary, then one must conclude that <u>empirically</u>

the theoretical model is misspecified; and that the legitimate variables are, in fact, associated with theoretically illegitimate variables (in a technical sense, see Rao and Miller, 1971:32-35).

The bias in estimating the exchange rate for legitimate, achieved characteristics is then a misspecification, and may be interpreted in an operational sense, as a (salary) measure of the effect of the association between legitimate and illegitimate variables.

[13]The sex payment differences for education are large dollar amounts, but as an artifact of the calculation standard, not highly significant.

The dummy variable standard for calculation of educational attainments is "no degree." Less than 3% of academic employees are without a degree. Calculation of educational coefficients against this small "standard" group results in large standard errors, and hence lowered statistical significance of the sex difference between the coefficients. The statistical artifact is corrected by comparing the contrast between the effects of the higher versus lower degrees for men and women.

[14]The professional schools are classified into two categories representing different areas of instruction: 1) the traditional, high status professions, that are linked to powerful functional areas, aligned with law, business, and technology (i.e., the schools of law, medicine, dentistry, engineering, business administration, and architecture and design); and 2) the less established, lower status professions, linked to the more marginal institutions, such as education, public health, and welfare (i.e., the schools of education, library science, nursing, public health, pharmacy, social work, natural resources, and music).

[15]To illustrate: in medicine, as in academia, women earn less than

men. At the same time, medical women profess less interest in money, and more interest in patients, and problems (Duberman, 1975:120). In other fields, women similarly express less interest in money (Sharp, 1970; Turner, 1964).

These altruistic interests may represent adjustment to both sex reward disparity, and sex role expectation. The strain of discrepant achievement reward may then be reduced by particular, gender achievement expectations: performance, through the service of others, rather than self; for intrinsic, rather than extrinsic, payment; in a private, rather than public, arena.

Women in medical practice are, in fact, concentrated in service and patient-intensive specializations. Among the women practicing medicine, 80% are concentrated in just three areas--psychiatry, pediatrics, and public health; only 36% of the male physicians, on the other hand, are in these areas. Similarly, in this University, women are in the service, and in the professional school units, adjoining the public health, welfare, and education areas.

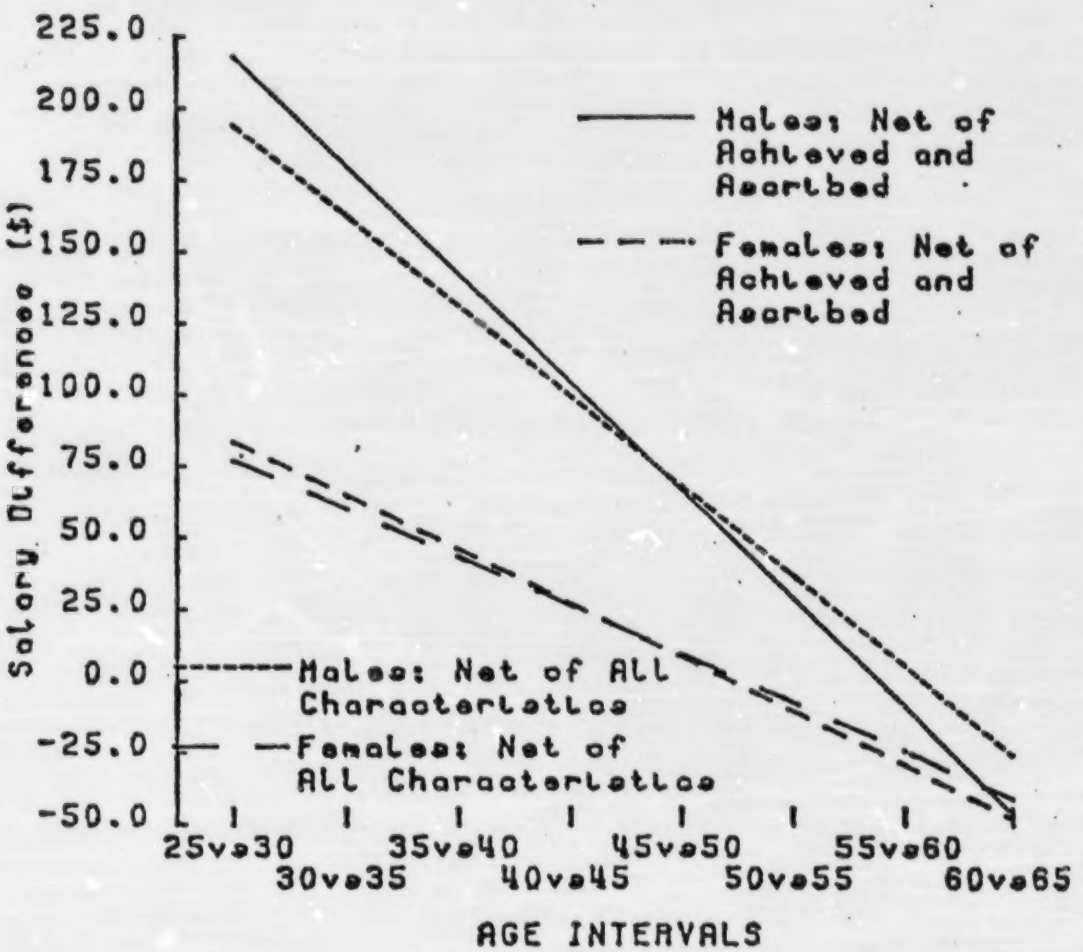

FIGURE 1

DIFFERENCES IN PREDICTED INCOME BETWEEN AGE INTERVALS, NET OF ACHIEVED AND ASCRIBED CHARACTERISTICS, WITH AND WITHOUT LOCATION

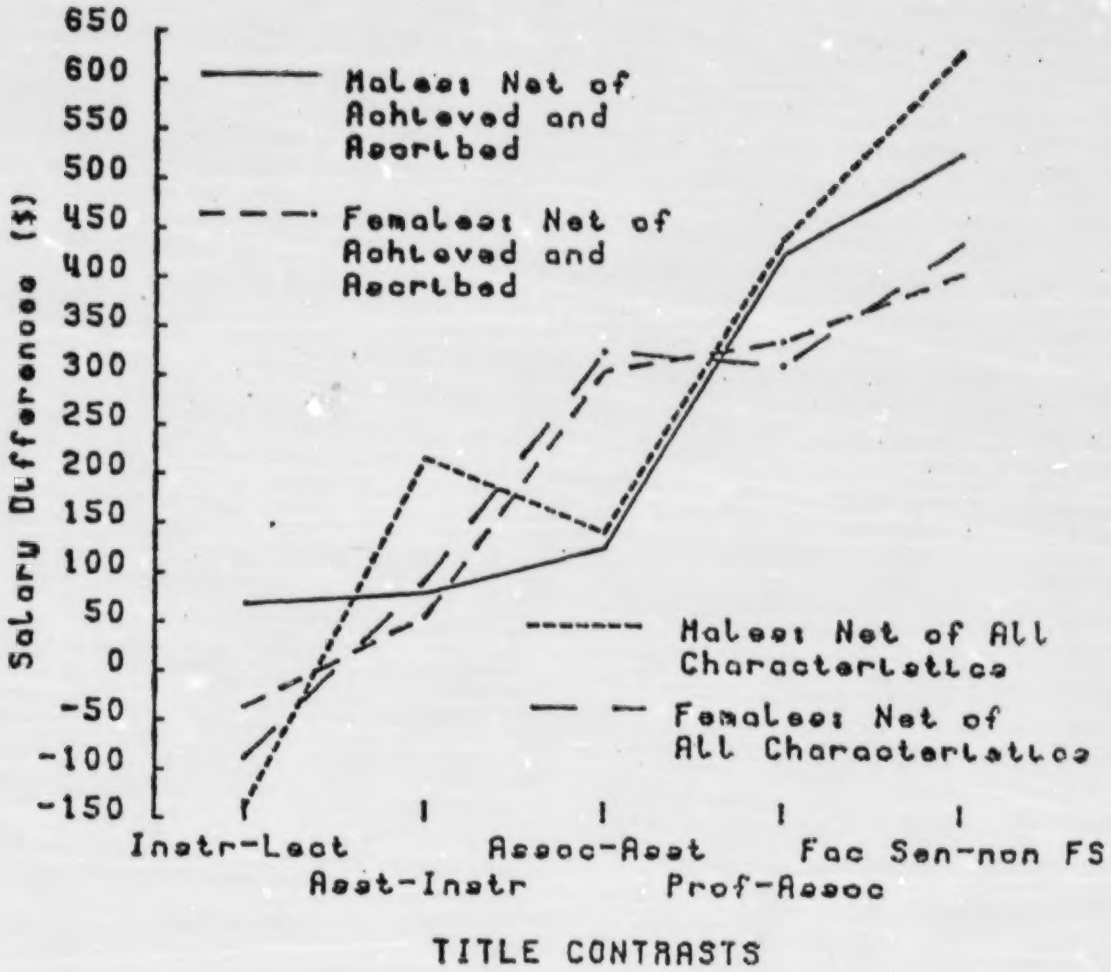

FIGURE 2

CONTRASTS BETWEEN INCOME COEFFICIENTS FOR ACADEMIC TITLES, NET OF ACHIEVED AND ASCRIBED CHARACTERISTICS, WITH AND WITHOUT LOCATION

TABLE 1

MULTIPLE REGRESSIONS OF INCOME PER MONTH ON ACHIEVED, ASCRIBED, AND LOCATION CHARACTERISTICS, BY SEX

Variable	Males		Females		Difference	
	Coeff. (S.E.)	Sig.	Coeff. (S.E.)	Sig.	Coeff. (S.E.)	Sig.
Constant	-1257.70		-80.56			
Age	73.24		33.90		39.34	
	(4.59)	.000	(5.93)	.000	(7.01)	.000
Age^2	-.63		-.34		-.29	
	(.05)	.000	(.06)	.000	(.08)	.000
Title:(1)						
Administrator	919.09		494.11		424.98	
	(39.01)	.000	(98.86)	.000	(106.28)	.000
Professor	1181.10		963.83		217.27	
	(26.09)	.000	(49.13)	.000	(55.63)	.000
Associate Prof	739.76		650.50		89.11	
	(25.84)	.000	(44.78)	.000	(51.70)	.042
Assistant Prof	597.59		324.05		273.54	
	(23.73)	.000	(38.89)	.000	(45.56)	.000
Instructor	381.35		231.61		149.74	
	(36.98)	.000	(35.92)	.000	(51.55)	.002
Lecturer	521.85		320.27		201.58	
	(34.33)	.000	(36.67)	.000	(50.23)	.000
Other Fac Sen	632.94		438.68		194.26	
	(37.00)	.000	(75.15)	.000	(83.77)	.010
Degree:(2)						
B.A./M.A.	172.52		63.34		109.18	
	(83.85)	.040	(59.98)	.291	(103.09)	.145
PhD/Prof.	269.59		247.66		48.93	
	(83.88)	.000	(62.65)	.000	(104.69)	.320
Years at Univ.	1.66		4.94		-3.28	
	(1.20)	.168	(1.59)	.002	(1.99)	.050
Race: White	24.82		-37.98		62.88	
	(28.47)	.383	(32.94)	.249	(43.54)	.075
Citizen: USA	81.13		49.44		31.69	
	(23.18)	.000	(38.74)	.202	(45.14)	.241

(1) As compared to "Other-Not Faculty Senate"
(2) As compared to "No Degree"

TABLE 1 (continued)

Variable	Males Coeff. (S.E.)	Males Sig.	Females Coeff. (S.E.)	Females Sig.	Difference Coeff. (S.E.)	Difference Sig.
Location Type:(3)						
Administrative	486.22		149.76		336.46	
	(55.23)	.000	(98.93)	.131	(113.30)	.001
Services	154.69		146.97		7.72	
	(32.05)	.000	(36.78)	.000	(48.79)	.437
Research	373.38		132.82		240.56	
	(25.95)	.000	(35.45)	.000	(43.94)	.000
Professional; Traditional(4)	90.36		-3.63		93.99	
	(19.59)	.000	(31.15)	.907	(36.80)	.005
Other(5)	-119.10		78.08		-197.18	
	(23.84)	.000	(32.22)	.016	(40.08)	.000
Other Campuses(6)	-211.36		24.55		-235.91	
	(31.93)	.000	(47.97)	.609	(57.63)	.000
LSA:						
Arts/Humanities	-287.60		-201.81		-85.79	
	(27.37)	.000	(40.51)	.000	(48.86)	.039
Nat/Phy/Bio Sci	-188.12		-218.36		30.24	
	(28.97)	.000	(47.24)	.000	(55.42)	.293
Social Sciences	-125.08		-81.21		-43.87	
	(31.87)	.000	(52.13)	.120	(61.10)	.236
Unit Size	.11		.12		-.01	
	(.02)	.000	(.04)	.001	(.04)	.421
% Unit Female	.84		-1.20		2.04	
	(.92)	.358	(.49)	.014	(1.04)	.025
Regression Summary Statistics						
R^2	.695		.640			
Std. Err.	396.09		255.20			
N	3921		807			

(3) As compared to average location salary (for each sex).
(4) Law, Medicine, Dentistry, Engineering, Architecture and Design, and Business Administration.
(5) Education, Library Science, Music, Natural Resources, Nursing, Pharmacy, Public Health, and Social Work.
(6) Dearborn and Flint.

TABLE 2

CONTRASTS BETWEEN COEFFICIENTS OF ACHIEVED AND LOCATION CHARACTERISTICS (NET OF ASCRIBED), BY SEX

Contrast	Males		Females		Difference	
	Coeff. (S.E.)	Sig.	Coeff. (S.E.)	Sig.	Coeff. (S.E.)	Sig.
Administrator vs Professor	-261.97 (38.91)	.000	-469.72 (106.06)	.000	207.75 (112.97)	.033
Professor vs Assoc. Prof.	441.29 (23.56)	.000	313.18 (54.56)	.000	128.11 (59.43)	.015
Associate Prof. vs Asst. Prof.	142.17 (25.69)	.000	326.60 (47.40)	.000	-184.43 (53.91)	.000
Assistant Prof. vs Instructor	216.25 (39.41)	.000	92.44 (43.32)	.033	123.82 (58.56)	.017
Instructor vs Lecturer	-140.50 (46.79)	.003	-88.66 (45.96)	.054	-51.84 (65.59)	.215
Other Fac. Sen. vs Not Fac. Sen.	632.94 (37.00)	.000	438.68 (75.16)	.000	194.26 (83.77)	.010
PhD/Prof. vs B.A./M.A.	124.06 (17.03)	.000	184.31 (25.66)	.000	-60.25 (30.80)	.025
Trad. Prof. vs Other Prof.	209.46 (28.78)	.000	-81.71 (46.97)	.082	291.17 (55.09)	.000
Arts/Human. vs Sciences	-99.48 (32.01)	.002	16.55 (57.50)	.773	-116.03 (65.81)	.039
Nat/Phy/Bio Sci vs Soc. Sci.	-63.05 (35.36)	.075	-137.15 (68.30)	.045	74.10 (76.91)	.168

TABLE 3

COMPARISON OF COEFFICIENTS OF ACHIEVED CHARACTERISTICS: GROSS AND NET EFFECTS, BY SEX

Variable	Gross Coefficients			Coefficients Net of Ascribed Characteristics					
	Males	Females	Differ.	Males	Change	Females	Change	Differ.	Change
Age	83.51	37.22	46.29	84.98	1.76%	37.29	.19%	47.69	3.02%
Age^2	-.74	-.37	-.36	-.75	1.35	-.37	.00	-.38	5.56
Title:(1)									
Administrator	824.95	440.65	384.30	812.87	-1.46	440.63	-.00	372.24	-3.14
Professor	940.09	893.49	46.60	934.58	-.59	891.37	-.24	43.21	-7.27
Associate Prof	513.75	553.69	-39.94	507.63	-1.19	553.51	-.03	-45.88	14.87
Assistant Prof	381.15	249.97	131.18	380.63	-.14	246.68	-1.32	133.95	2.11
Instructor	308.23	192.69	115.54	300.65	-2.46	191.14	-.80	109.51	-5.22
Lecturer	237.27	231.02	6.25	232.48	-2.02	228.19	-1.23	4.29	-31.36
Other Fac Sen	538.52	404.60	133.92	529.66	-1.65	407.53	.72	122.13	-8.80
Degree:(2)									
B.A./M.A.	223.67	105.19	118.42	213.25	-4.66	110.33	4.89	102.92	-13.09
PhD/Prof.	382.61	313.23	69.38	377.06	-1.45	321.32	2.58	55.74	-19.66
Years at Univ.	4.41	5.47	-1.06	3.63	-17.69	5.48	.18	-1.85	74.53

(1) As compared to "Other-Not Faculty Senate"
(2) As compared to "No Degree"

TABLE 4

COMPARISON OF COEFFICIENTS OF ASCRIBED CHARACTERISTICS: GROSS AND NET EFFECTS, BY SEX

Variable	Gross Coefficients			Coefficients Net of Achieved Characteristics					
	Males	Females	Differ.	Males	Change	Females	Change	Differ.	Change
Race: White	136.70	27.49	109.21	33.95	-75.16%	34.55	-225.68%	68.50	-37.28%
Citizen: USA	275.02	74.53	200.48	124.52	-54.72	49.98	-32.94	74.54	-62.82

TABLE 5

COMPARISON OF COEFFICIENTS OF ACHIEVED CHARACTERISTICS: NET EFFECTS, WITH AND WITHOUT LOCATION, BY SEX

Variable	Net Coefficients Without Location			Net Coefficients With Location					
	Males	Females	Differ.	Males	Change	Females	Change	Differ.	Change
Age	84.98	37.29	47.69	73.24	-13.82%	33.90	-9.09%	39.34	-17.51%
Age^2	-.75	-.37	-.38	-.63	-16.00	-.34	-8.11	-.29	-23.68
Title:(1)									
Administrator	812.87	440.63	372.24	919.09	13.07	494.11	12.14	424.98	14.17
Professor	934.58	891.37	43.21	1181.10	26.38	963.83	8.13	217.27	402.82
Associate Prof	507.63	553.51	-45.88	739.76	45.73	650.50	17.52	89.11	-294.22
Assistant Prof	380.63	246.68	133.95	597.59	57.00	324.05	31.36	273.54	104.21
Instructor	300.65	191.14	109.51	381.35	26.84	231.61	21.17	149.74	36.74
Lecturer	232.48	228.19	4.29	521.85	124.47	320.27	40.35	201.58	4598.83
Other Fac Sen	529.66	407.53	122.13	632.94	19.50	438.68	7.64	194.26	59.06
Degree:(2)									
B.A./M.A.	213.25	110.33	102.92	172.52	-19.10	63.34	-42.59	109.18	6.08
PhD/Prof.	377.06	321.32	55.74	269.59	-28.50	247.66	-22.92	48.93	-12.22
Years at Univ.	3.63	5.48	-1.85	1.66	-54.27	4.94	-9.85	-3.28	77.30

(1) As compared to "Other-Not Faculty Senate"
(2) As compared to "No Degree"

TABLE 6

COMPARISON OF NET CONTRASTS BETWEEN ACHIEVED CHARACTERISTICS, WITH AND WITHOUT LOCATION, BY SEX

Contrast	Net Coefficients Without Location			Net Coefficients With Location					
	Males	Females	Differ.	Males	Change	Females	Change	Differ.	Change
Administrator vs Professor	-121.71	-450.74	329.03	-261.97	115.24%	-469.72	4.21%	207.75	-36.86%
Professor vs Assoc. Prof	426.95	337.86	84.39	441.29	3.36	313.18	-7.30	128.11	51.81
Associate Prof. vs Asst. Prof.	126.99	306.83	-179.84	142.17	11.95	326.60	6.44	-184.43	2.55
Assistant Prof. vs Instructor	79.98	55.55	24.43	216.25	170.38	92.44	66.41	123.82	406.84
Instructor vs Lecturer	68.17	-37.06	105.23	-140.50	-306.10	-88.66	139.23	-51.84	-149.26
Other Fac. Sen. vs Not Fac Sen	529.66	407.53	122.13	632.94	19.50	438.68	7.64	194.26	59.06
PhD/Prof. vs B.A./M.A.	163.81	210.99	-47.18	124.06	-24.27	184.31	-12.65	-60.25	27.70

TABLE 7

COMPARISON OF COEFFICIENTS OF ASCRIBED CHARACTERISTICS: NET EFFECTS, WITH AND WITHOUT LOCATION, BY SEX

Variable	Net Coefficients Without Location			Net Coefficients With Location					
	Males	Females	Differ.	Males	Change	Females	Change	Differ.	Change
Race: White	33.95	-34.55	68.50	24.82	-26.89%	-37.98	9.93%	62.88	-8.20%
Citizen: USA	124.52	49.98	74.54	81.13	-34.85	49.44	-1.08	31.69	-57.49

TABLE 8

COMPARISON OF COEFFICIENTS OF LOCATION CHARACTERISTICS: GROSS AND NET EFFECTS, BY SEX

Variable	Gross Coefficients			Coefficients Net of All Characteristics					
	Males	Females	Differ.	Males	Change	Females	Change	Differ.	Change
Location Type:[1]									
Administrative	124.55	-7.17	131.72	486.22	290.4%	149.76	-2188.%	336.46	155.4%
Services	-473.68	-83.35	-390.33	154.69	-132.7	146.97	-276.3	7.72	-102.0
Research	-182.31	-82.92	-99.39	373.38	-304.8	132.82	-260.2	240.56	-342.0
Professional:									
Traditional[2]	155.18	-32.48	187.66	90.36	-41.8	-3.63	-88.8	93.99	-49.9
Other[3]	-130.53	204.49	-335.02	-119.10	-8.8	78.08	-61.8	-197.18	-41.1
Other Campuses[4]	-366.34	172.80	-539.14	-211.36	-42.3	24.55	-85.8	-235.91	-56.2
LSA:									
Arts/Humanities	171.25	-127.73	298.98	-287.60	-267.9	-201.81	58.0	-85.79	-128.7
Nat/Phy/Bio Sci	168.33	-195.85	364.18	-188.12	-211.8	-218.36	11.5	30.24	-91.7
Social Sciences	407.09	78.69	328.40	-125.08	-130.7	-81.21	-203.2	-43.87	-113.4
Unit Size	-.33	.14	-.47	.11	-133.3	.12	-14.3	-.01	-97.9
% Unit Female	-1.30	-.90	-.40	.84	-164.6	-1.20	33.3	2.04	-610.0

(1) As compared to average location salary (for each sex).
(2) Law, Medicine, Dentistry, Engineering, Architecture and Design, and Business Administration.
(3) Education, Library Science, Music, Natural Resources, Nursing, Pharmacy, Public Health and Social Work.
(4) Dearborn and Flint.

TABLE 9

RANK ORDERING OF COEFFICIENTS OF LOCATION TYPE, NET AND GROSS OF ACHIEVED AND ASCRIBED CHARACTERISTICS, BY SEX

Males			Females		
Location	Net Coeff.	Gross Coeff.	Location	Net Coeff.	Gross Coeff.
Admin.	486.22	124.55 5	Admin.	149.76	-7.17 4
Research	373.38	-182.31 7	Services	146.97	-83.35 7
Services	154.69	-473.68 9	Research	132.82	-82.92 6
Trad. Prof.	90.36	155.18 4	Other Prof.	78.08	204.49 1
Other Prof.	-119.10	-130.53 6	Other Camp.	24.54	172.80 2
LSA Soc Sci	-125.08	407.09 1	Trad. Prof.	-3.36	-32.48 5
LSA Nat Sci	-188.12	168.33 3	LSA Soc Sci	-81.21	78.68 3
Other Camp.	-211.36	-366.34 8	LSA Art/Hum	-201.81	-127.80 8
LSA Art/Hum	-287.60	171.25 2	LSA Nat Sci	-218.36	-195.85 9

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